

**WHAT IS CLAIMED IS:**

1           1.       A composition for delivery of a 5-HT agonist across the oral mucosa,  
2 said composition comprising:

- 3           (a) a 5-HT agonist or a pharmaceutically acceptable salt thereof;  
4           (b) a carrier; and  
5           (c) a ternary buffer system comprising a carbonate salt, a bicarbonate salt, and a  
6           metal oxide,

7 wherein said ternary buffer system raises the pH of saliva to a pH greater than about 9.9  
8 irrespective of the starting pH of saliva.

1           2.       A composition of claim 1, wherein said ternary buffer system raises the  
2 pH of saliva to a pH of from about 9.9 to about 11 irrespective of the starting pH of saliva.

1           3.       A composition of claim 1, wherein said 5-HT agonist is selected from  
2 the group consisting of sumatriptan, naratriptan, rizatriptan, eletriptan, almotriptan,  
3 zolmitriptan, frovatriptan, and combinations thereof.

1           4.       A composition of claim 1, wherein said carbonate salt is selected from  
2 the group consisting of sodium carbonate and potassium carbonate.

1           5.       A composition of claim 1, wherein said bicarbonate salt is selected  
2 from the group consisting of sodium bicarbonate and potassium bicarbonate.

1           6.       A composition of claim 1, wherein said metal oxide is selected from  
2 the group consisting of magnesium oxide and aluminum oxide.

1           7.       A composition of claim 6, wherein said magnesium oxide is  
2 amorphous magnesium oxide.

1           8.       A composition of claim 1, wherein said ternary buffer system  
2 comprises sodium carbonate, sodium bicarbonate, and amorphous magnesium oxide.

1           9.       A composition of claim 1, wherein said carrier is selected from the  
2 group consisting of a binder, a gum base, and combinations thereof.

1           10.      A composition of claim 9, wherein said gum base comprises at least  
2 one hydrophobic polymer and at least one hydrophilic polymer.

- 1           **11.**    A composition of claim 9, wherein said binder is selected from the  
2 group consisting of a sugar, a sugar alcohol, and combinations thereof.
- 1           **12.**    A composition of claim 11, wherein said sugar alcohol is selected from  
2 the group consisting of mannitol, sorbitol, xylitol, and combinations thereof.
- 1           **13.**    A composition of claim 1, wherein said composition is a dosage form  
2 selected from the group consisting of a lozenge, a chewing gum, a chewable tablet, and a  
3 dissolving tablet.
- 1           **14.**    A composition of claim 13, wherein said dissolving tablet is selected  
2 from the group consisting of a slow-dissolving tablet and a quick-dissolving tablet.
- 1           **15.**    A composition of claim 1, wherein said oral mucosa is selected from  
2 the group consisting of the sublingual mucosa, the buccal mucosa, and a combination thereof.
- 1           **16.**    A composition of claim 1, further comprising a 5-HT antagonist.
- 1           **17.**    A composition of claim 1, further comprising a non-steroidal anti-  
2 inflammatory drug (NSAID).
- 1           **18.**    A composition of claim 1, wherein the average particle size of said 5-  
2 HT agonist or a pharmaceutically acceptable salt thereof is less than or equal to the average  
3 particle size of said carrier.
- 1           **19.**    A composition of claim 1, wherein said 5-HT agonist is sumatriptan  
2 and said ternary buffer system comprises sodium carbonate, sodium bicarbonate, and  
3 amorphous magnesium oxide.
- 1           **20.**    A composition of claim 19, wherein said composition is a lozenge or a  
2 dissolving tablet.
- 1           **21.**    A composition of claim 20, wherein said composition is administered  
2 sublingually.
- 1           **22.**    A composition of claim 19, wherein said sodium bicarbonate is  
2 dessicant-coated sodium bicarbonate.

1           **23.**    A composition of claim 19, wherein the weight percent of amorphous  
2 magnesium oxide is greater than the combined weight percent of sodium carbonate and  
3 sodium bicarbonate.

1           **24.**    A composition of claim 23, wherein said composition comprises from  
2 about 2.5 to about 4.5 weight percent sumatriptan; from about 4.0 to about 7.0 weight percent  
3 sodium carbonate; from about 8.0 to about 12.0 weight percent dessicant-coated sodium  
4 bicarbonate; and from about 20 to about 30 weight percent amorphous magnesium oxide.

1           **25.**    A composition of claim 24, wherein composition comprises about 3.5  
2 weight percent sumatriptan; about 5.5 weight percent sodium carbonate; about 9.0 weight  
3 percent dessicant-coated sodium bicarbonate; and about 25 weight percent amorphous  
4 magnesium oxide.

1           **26.**    A composition for delivery of a 5-HT agonist across the oral mucosa,  
2 said composition comprising:

3           (a) a 5-HT agonist or a pharmaceutically acceptable salt thereof;

4           (b) a carrier; and

5           (c) a ternary buffer system comprising a carbonate salt, a bicarbonate salt, and a  
6 citrate, phosphate, or borate salt,

7 wherein said ternary buffer system raises the pH of saliva to a pH greater than about 9.9  
8 irrespective of the starting pH of saliva.

1           **27.**    A composition of claim 26, wherein said ternary buffer system raises  
2 the pH of saliva to a pH of from about 9.9 to about 11 irrespective of the starting pH of  
3 saliva.

1           **28.**    A composition of claim 26, wherein said 5-HT agonist is selected from  
2 the group consisting of sumatriptan, naratriptan, rizatriptan, eletriptan, almotriptan,  
3 zolmitriptan, frovatriptan, and combinations thereof.

1           **29.**    A composition of claim 26, wherein said carbonate salt is selected  
2 from the group consisting of sodium carbonate and potassium carbonate.

1           **30.**    A composition of claim 26, wherein said bicarbonate salt is selected  
2 from the group consisting of sodium bicarbonate and potassium bicarbonate.

1           **31.**     A composition of claim 26, wherein said citrate salt is selected from  
2 the group consisting of sodium citrate, potassium citrate, calcium citrate, magnesium citrate,  
3 and ammonium citrate.

1           **32.**     A composition of claim 26, wherein said phosphate salt is selected  
2 from the group consisting of monobasic sodium phosphate, dibasic sodium phosphate,  
3 monobasic potassium phosphate, dibasic potassium phosphate, monobasic calcium  
4 phosphate, dibasic calcium phosphate, monobasic magnesium phosphate, dibasic magnesium  
5 phosphate, monobasic ammonium phosphate, and dibasic ammonium phosphate.

1           **33.**     A composition of claim 26, wherein said borate salt is selected from  
2 the group consisting of sodium borate, potassium borate, calcium borate, magnesium borate,  
3 and ammonium borate.

1           **34.**     A composition of claim 26, further comprising a metal oxide.

1           **35.**     A composition of claim 26, wherein said carrier is selected from the  
2 group consisting of a binder, a gum base, and combinations thereof.

1           **36.**     A composition of claim 26, wherein said composition is a dosage form  
2 selected from the group consisting of a lozenge, a chewing gum, a chewable tablet, and a  
3 dissolving tablet.

1           **37.**     A composition of claim 36, wherein said dissolving tablet is selected  
2 from the group consisting of a slow-dissolving tablet and a quick-dissolving tablet.

1           **38.**     A composition of claim 26, wherein said oral mucosa is selected from  
2 the group consisting of the sublingual mucosa, the buccal mucosa, and a combination thereof.

1           **39.**     A composition of claim 26, wherein the average particle size of said 5-  
2 HT agonist or a pharmaceutically acceptable salt thereof is less than or equal to the average  
3 particle size of said carrier.

1           **40.**     A composition of claim 26, wherein said 5-HT agonist is sumatriptan  
2 and said ternary buffer system comprises sodium carbonate, sodium bicarbonate, and a  
3 citrate, phosphate, or borate salt.

1                   41.     A composition of claim 40, wherein said composition is a lozenge or a  
2     dissolving tablet.

1                   42.     A composition of claim 41, wherein said composition is administered  
2     sublingually.

1                   43.     A composition for delivery of a 5-HT agonist across the oral mucosa,  
2     said composition comprising:  
3             (a) a 5-HT agonist or a pharmaceutically acceptable salt thereof;  
4             (b) a carrier; and  
5             (c) a buffer system comprising a carbonate salt or a bicarbonate salt and two or more  
6             buffering agents selected from the group consisting of a metal oxide, a citrate salt,  
7             a phosphate salt, and a borate salt,  
8     wherein said buffer system raises the pH of saliva to a pH greater than about 9.9 irrespective  
9     of the starting pH of saliva.

1                   44.     A composition of claim 43, wherein said ternary buffer system raises  
2     the pH of saliva to a pH of from about 9.9 to about 11 irrespective of the starting pH of  
3     saliva.

1                   45.     A composition of claim 43, wherein said 5-HT agonist is selected from  
2     the group consisting of sumatriptan, naratriptan, rizatriptan, eletriptan, almotriptan,  
3     zolmitriptan, frovatriptan, and combinations thereof.

1                   46.     A composition of claim 43, wherein said carbonate salt is selected  
2     from the group consisting of sodium carbonate and potassium carbonate.

1                   47.     A composition of claim 43, wherein said bicarbonate salt is selected  
2     from the group consisting of sodium bicarbonate and potassium bicarbonate.

1                   48.     A composition of claim 43, wherein said carrier is selected from the  
2     group consisting of a binder, a gum base, and combinations thereof.

1                   49.     A composition of claim 43, wherein said composition is a dosage form  
2     selected from the group consisting of a lozenge, a chewing gum, a chewable tablet, and a  
3     dissolving tablet.

1           **50.**     A composition of claim 49, wherein said dissolving tablet is selected  
2 from the group consisting of a slow-dissolving tablet and a quick-dissolving tablet.

1           **51.**     A composition of claim 43, wherein said oral mucosa is selected from  
2 the group consisting of the sublingual mucosa, the buccal mucosa, and a combination thereof.

1           **52.**     A composition of claim 43, wherein the average particle size of said 5-  
2 HT agonist or a pharmaceutically acceptable salt thereof is less than or equal to the average  
3 particle size of said carrier.

1           **53.**     A composition of claim 43, wherein said composition is administered  
2 sublingually.

1           **54.**     A composition for delivery of a 5-HT agonist across the oral mucosa,  
2 said composition comprising:

3           (a) a 5-HT agonist or a pharmaceutically acceptable salt thereof;

4           (b) a carrier; and

5           (c) a binary buffer system comprising a carbonate salt or a bicarbonate salt and a  
6 metal oxide,

7 wherein said binary buffer system raises the pH of saliva to a pH greater than about 9.9  
8 irrespective of the starting pH of saliva.

1           **55.**     A composition of claim 54, wherein said binary buffer system raises  
2 the pH of saliva to a pH of from about 9.9 to about 11 irrespective of the starting pH of  
3 saliva.

1           **56.**     A composition of claim 54, wherein said 5-HT agonist is selected from  
2 the group consisting of sumatriptan, naratriptan, rizatriptan, eletriptan, almotriptan,  
3 zolmitriptan, frovatriptan, and combinations thereof.

1           **57.**     A composition of claim 54, wherein said carbonate salt is selected  
2 from the group consisting of sodium carbonate and potassium carbonate.

1           **58.**     A composition of claim 54, wherein said bicarbonate salt is selected  
2 from the group consisting of sodium bicarbonate and potassium bicarbonate.

1                   **59.**     A composition of claim 54, wherein said metal oxide is selected from  
2 the group consisting of magnesium oxide and aluminum oxide.

1                   **60.**     A composition of claim 59, wherein said magnesium oxide is  
2 amorphous magnesium oxide.

1                   **61.**     A composition of claim 54, wherein said binary buffer system  
2 comprises sodium carbonate and amorphous magnesium oxide.

1                   **62.**     A composition of claim 54, wherein said binary buffer system  
2 comprises sodium bicarbonate and amorphous magnesium oxide.

1                   **63.**     A composition of claim 54, wherein said carrier is selected from the  
2 group consisting of a binder, a gum base, and combinations thereof.

1                   **64.**     A composition of claim 54, wherein said composition is a dosage form  
2 selected from the group consisting of a lozenge, a chewing gum, a chewable tablet, and a  
3 dissolving tablet.

1                   **65.**     A composition of claim 56, wherein said dissolving tablet is selected  
2 from the group consisting of a slow-dissolving tablet and a quick-dissolving tablet.

1                   **66.**     A composition of claim 54, wherein said oral mucosa is selected from  
2 the group consisting of the sublingual mucosa, the buccal mucosa, and a combination thereof.

1                   **67.**     A composition of claim 54, wherein the average particle size of said 5-  
2 HT agonist or a pharmaceutically acceptable salt thereof is less than or equal to the average  
3 particle size of said carrier.

1                   **68.**     A composition of claim 54, wherein said 5-HT agonist is sumatriptan  
2 and said binary buffer system comprises sodium carbonate or sodium bicarbonate and  
3 amorphous magnesium oxide.

1                   **69.**     A composition of claim 68, wherein said composition is a lozenge or a  
2 dissolving tablet.

1                   **70.**     A composition of claim 69, wherein said composition is administered  
2 sublingually.

1                   71.     A composition of claim 68, wherein the weight percent of amorphous  
2 magnesium oxide is greater than the weight percent of sodium carbonate or sodium  
3 bicarbonate.

1                   72.     A composition for delivery of a 5-HT agonist across the oral mucosa,  
2 said composition comprising:

3                   (a) a 5-HT agonist or a pharmaceutically acceptable salt thereof;

4                   (b) a carrier; and

5                   (c) a binary buffer system comprising a carbonate salt or a bicarbonate salt and a  
6                   -citrate, phosphate, or borate salt,

7 wherein said binary buffer system raises the pH of saliva to a pH greater than about 9.9  
8 irrespective of the starting pH of saliva.

1                   73.     A composition of claim 72, wherein said binary buffer system raises  
2 the pH of saliva to a pH of from about 9.9 to about 11 irrespective of the starting pH of  
3 saliva.

1                   74.     A composition of claim 72, wherein said 5-HT agonist is selected from  
2 the group consisting of sumatriptan, naratriptan, rizatriptan, eletriptan, almotriptan,  
3 zolmitriptan, frovatriptan, and combinations thereof.

1                   75.     A composition of claim 72, wherein said carbonate salt is selected  
2 from the group consisting of sodium carbonate and potassium carbonate.

1                   76.     A composition of claim 72, wherein said bicarbonate salt is selected  
2 from the group consisting of sodium bicarbonate and potassium bicarbonate.

1                   77.     A composition of claim 72, wherein said carrier is selected from the  
2 group consisting of a binder, a gum base, and combinations thereof.

1                   78.     A composition of claim 72, wherein said composition is a dosage form  
2 selected from the group consisting of a lozenge, a chewing gum, a chewable tablet, and a  
3 dissolving tablet.

1                   79.     A composition of claim 78, wherein said dissolving tablet is selected  
2 from the group consisting of a slow-dissolving tablet and a quick-dissolving tablet.

1           **80.**     A composition of claim 72, wherein said oral mucosa is selected from  
2 the group consisting of the sublingual mucosa, the buccal mucosa, and a combination thereof.

1           **81.**     A composition of claim 72, wherein the average particle size of said 5-  
2 HT agonist or a pharmaceutically acceptable salt thereof is less than or equal to the average  
3 particle size of said carrier.

1           **82.**     A composition of claim 72, wherein said 5-HT agonist is sumatriptan  
2 and said binary buffer system comprises sodium carbonate or sodium bicarbonate and and a  
3 citrate, phosphate, or borate salt.

1           **83.**     A composition of claim 82, wherein said composition is a lozenge or a  
2 dissolving tablet.

1           **84.**     A composition of claim 83, wherein said composition is administered  
2 sublingually.

1           **85.**     A composition for delivery of a 5-HT agonist across the oral mucosa,  
2 said composition comprising:

3           (a) a 5-HT agonist or a pharmaceutically acceptable salt thereof;

4           (b) a carrier; and

5           (c) a binary buffer system comprising a metal oxide and a citrate, phosphate, or  
6 borate salt,

7 wherein said binary buffer system raises the pH of saliva to a pH greater than about 9.9  
8 irrespective of the starting pH of saliva.

1           **86.**     A composition of claim 85, wherein said binary buffer system raises  
2 the pH of saliva to a pH of from about 9.9 to about 11 irrespective of the starting pH of  
3 saliva.

1           **87.**     A composition of claim 85, wherein said 5-HT agonist is selected from  
2 the group consisting of sumatriptan, naratriptan, rizatriptan, eletriptan, almotriptan,  
3 zolmitriptan, frovatriptan, and combinations thereof.

1           **88.**     A composition of claim 85, wherein said metal oxide is selected from  
2 the group consisting of magnesium oxide and aluminum oxide.

1                   **89.**     A composition of claim **88**, wherein said magnesium oxide is  
2 amorphous magnesium oxide.

1                   **90.**     A composition of claim **85**, wherein said carrier is selected from the  
2 group consisting of a binder, a gum base, and combinations thereof.

1                   **91.**     A composition of claim **85**, wherein said composition is a dosage form  
2 selected from the group consisting of a lozenge, a chewing gum, a chewable tablet, and a  
3 dissolving tablet.

1                   **92.**     A composition of claim **91**, wherein said dissolving tablet is selected  
2 from the group consisting of a slow-dissolving tablet and a quick-dissolving tablet.

1                   **93.**     A composition of claim **85**, wherein said oral mucosa is selected from  
2 the group consisting of the sublingual mucosa, the buccal mucosa, and a combination thereof.

1                   **94.**     A composition of claim **85**, wherein the average particle size of said 5-  
2 HT agonist or a pharmaceutically acceptable salt thereof is less than or equal to the average  
3 particle size of said carrier.

1                   **95.**     A composition of claim **85**, wherein said 5-HT agonist is sumatriptan  
2 and said binary buffer system comprises amorphous magnesium oxide and a citrate,  
3 phosphate, or borate salt.

1                   **96.**     A composition of claim **95**, wherein said composition is a lozenge or a  
2 dissolving tablet.

1                   **97.**     A composition of claim **96**, wherein said composition is administered  
2 sublingually.

1                   **98.**     A composition for delivery of a 5-HT agonist across the oral mucosa,  
2 said composition comprising:

- 3                   (a) a 5-HT agonist or a pharmaceutically acceptable salt thereof;  
4                   (b) a carrier; and  
5                   (c) a binary buffer system comprising a carbonate salt and a bicarbonate salt,

6                    wherein said binary buffer system raises the pH of saliva to a pH greater than  
7                    about 9.9 irrespective of the starting pH of saliva.

1                    **99.**     A composition of claim 98, wherein said 5-HT agonist is sumatriptan  
2                    and said binary buffer system is combined with sumatriptan to form a solution just prior to  
3                    delivery of sumatriptan to the oral mucosa.

1                    **100.**    A composition of claim 98, wherein said 5-HT agonist is sumatriptan  
2                    and said binary buffer system comprises sodium bicarbonate and sodium carbonate wherein  
3                    the ratio of sodium bicarbonate to sodium carbonate is from about 2:1 to about 5:1 by  
4                    weight.

1                    **101.**    A composition of claim 100, said composition delivering a peak  
2                    plasma concentration within about 1-15 minutes following administration.

1                    **102.**    A method for treating a migraine in a subject in need thereof, said  
2                    method comprising:

3                    administering to said subject a composition comprising a therapeutically  
4                    effective amount of sumatriptan or a pharmaceutically acceptable salt thereof, a carrier, and a  
5                    binary buffer system comprising a carbonate salt and a bicarbonate salt, wherein said binary  
6                    buffer system raises the pH of saliva to a pH greater than about 9.9 irrespective of the starting  
7                    pH of saliva.

1                    **103.**    A method in accordance with claim 102, wherein said composition is a  
2                    solution composition.

1                    **104.**    A method in accordance with claim 103, wherein said binary buffer  
2                    system comprises sodium bicarbonate and sodium carbonate wherein the ratio of sodium  
3                    bicarbonate to sodium carbonate is from about 2:1 to about 5:1 by weight, and said  
4                    composition provides a peak plasma concentration within about 1-15 minutes following  
5                    administration to said subject.

1                    **105.**    A method for treating a migraine in a subject in need thereof, said  
2                    method comprising:

3                    administering to said subject a composition comprising a therapeutically  
4                    effective amount of a 5-HT agonist or a pharmaceutically acceptable salt thereof, a carrier,

5 and a ternary buffer system comprising a carbonate salt, a bicarbonate salt, and a metal oxide,  
6 wherein said ternary buffer system raises the pH of saliva to a pH greater than about 9.9  
7 irrespective of the starting pH of saliva.

1           **106.** A method of claim **105**, wherein said ternary buffer system raises the  
2 pH of saliva to a pH of from about 9.9 to about 11 irrespective of the starting pH of saliva.

1           **107.** A method of claim **105**, wherein said composition delivers said 5-HT  
2 agonist across the oral mucosa.

1           **108.** A method of claim **107**, wherein said oral mucosa is selected from the  
2 group consisting of the sublingual mucosa, the buccal mucosa, and a combination thereof.

1           **109.** A method of claim **105**, wherein said migraine is selected from the  
2 group consisting of a migraine without aura and a migraine with aura.

1           **110.** A method of claim **105**, wherein said 5-HT agonist is selected from the  
2 group consisting of sumatriptan, naratriptan, rizatriptan, eletriptan, almotriptan, zolmitriptan,  
3 frovatriptan, and combinations thereof.

1           **111.** A method of claim **105**, wherein said carbonate salt is selected from  
2 the group consisting of sodium carbonate and potassium carbonate.

1           **112.** A method of claim **105**, wherein said bicarbonate salt is selected from  
2 the group consisting of sodium bicarbonate and potassium bicarbonate.

1           **113.** A method of claim **105**, wherein said metal oxide is selected from the  
2 group consisting of magnesium oxide and aluminum oxide.

1           **114.** A method of claim **113**, wherein said magnesium oxide is amorphous  
2 magnesium oxide.

1           **115.** A method of claim **105**, wherein said ternary buffer system comprises  
2 sodium carbonate, sodium bicarbonate, and amorphous magnesium oxide.

1           **116.** A method of claim **105**, wherein said carrier is selected from the group  
2 consisting of a binder, a gum base, and combinations thereof.

1                   **117.** A method of claim **105**, wherein said composition is a dosage form  
2 selected from the group consisting of a lozenge, a chewing gum, a chewable tablet, and a  
3 dissolving tablet.

1                   **118.** A method of claim **117**, wherein said dissolving tablet is selected from  
2 the group consisting of a slow-dissolving tablet and a quick-dissolving tablet.

1                   **119.** A method of claim **105**, wherein said oral mucosa is selected from the  
2 group consisting of the sublingual mucosa, the buccal mucosa, and a combination thereof.

1                   **120.** A method of claim **105**, further comprising a 5-HT antagonist.

1                   **121.** A method of claim **105**, further comprising a non-steroidal anti-  
2 inflammatory drug (NSAID).

1                   **122.** A method of claim **105**, wherein the average particle size of said 5-HT  
2 agonist or a pharmaceutically acceptable salt thereof is less than or equal to the average  
3 particle size of said carrier.

1                   **123.** A method of claim **105**, wherein said 5-HT agonist is sumatriptan and  
2 said ternary buffer system comprises sodium carbonate, sodium bicarbonate, and amorphous  
3 magnesium oxide.

1                   **124.** A method of claim **123**, wherein said composition is a lozenge or a  
2 dissolving tablet.

1                   **125.** A method of claim **124**, wherein said composition is administered  
2 sublingually.

1                   **126.** A method of claim **123**, wherein the weight percent of amorphous  
2 magnesium oxide is greater than the combined weight percent of sodium carbonate and  
3 sodium bicarbonate.